



# Financing Adaptation Options: Western Australia Case Study

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Australian Coastal Councils Conference

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# Project History

Commenced in 2012 with Shire of Dandaragan, NACC, state government

In accordance with the *WA Coastal Planning Policy (SPP2.6) - P&D Act 2004*

Specialist advice and peer review - government agencies, engineering and planning specialists, universities



# Coastal Hazard Risk Management & Adaptation Planning (CHRMAP)

A risk management process that considers coastal hazards (long term coastal erosion and coastal inundation).

1

Identify potential hazard areas

2

Identify assets located in hazard areas = risk

3

Identify adaptation options for reducing risk

4

Implement most feasible options

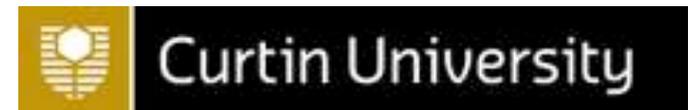


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# CHRMAP

Obligation under 2013 revised *State Planning Policy 2.6 (Coastal Planning Policy)*, *Planning & Development Act (2004)*

Revised largely in response to increasing sea levels - *Sea Level Change in Western Australia. Application to Coastal Planning (2010)*, 0.9m by 2100



# Adaptation Hierarchy

**1. Do-nothing:** Useful in areas absent of human-made public and private assets, where coastal erosion can be allowed to take its course with relatively little impact.

**2. Avoid:** Aims to avoid the presence of *new* development on greenfield and infill sites within a coastal hazard area.

**3. Managed Realignment (or Relocate):** The deliberate process of allowing coastal processes to take their natural course.

**4. Accommodate:** Regarded as a viable solution for managing the potential impacts of coastal *inundation* through measures such as minimum floor levels.

**5. Protect:** Maintain the shoreline in a fixed position. Considered a last resort: high costs, negative down-drift impacts and visual amenity; reduced flexibility for future decision makers.



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# Adaptation Strategies



**Strategy 1: Managed Realignment (or relocate):**

Deliberate process of allowing coastal processes to take their natural course.  
Land acquisitions.

**Strategy 2: Coastal Protection and preservation of beach amenity**

Most expensive  
Rock groynes and sand nourishment

**Strategy 3: Coastal Protection but loss of beach amenity**

Least expensive  
Limestone seawall

**Strategy 4: Informed Community Adaptation**

Case by case assessment  
Does not guarantee a uniform approach to relocation or protection



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Photo Nick Kraus, via Enzo Pranzini

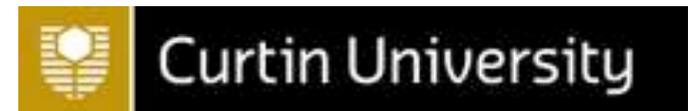


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# Strategy Evaluation

Estimated economic costs and benefits	Managed Realignment	Protect 1*	Protect 2*	Informed Adaptation
<b>Cost (total)</b>	\$19 mil	\$35 mil	\$35 mil	\$18.5 mil
<b>Benefits (total)</b>	\$39 mil	\$43 mil	\$12 mil	\$35 mil
<b>CBA Ratio</b>	<b>2.106</b>	<b>1.219</b>	<b>0.340</b>	<b>1.916</b>
<b>Direct cost to the Shire</b>	\$13 mil	\$125k	\$125k	\$1.7 mil

\* Assumes costs of protection are largely paid for by landowners in coastal hazard areas.



# Funding Availability

Federal

?

State

WA DoTransport. ~\$1million per annum. \$300k maximum grant

State

WA DoPlanning. ~\$250k. \$50k maximum grant

Local

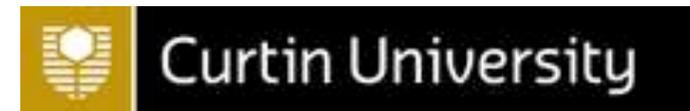
< \$7.5million per annum rate revenue



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# Specified Area Rates?

#	Option	Managed Realignment	Protect 1	Protect 2
1	100% paid by landowners in the hazard area (per landowner per annum to 2070)	n/a	\$28,000	\$3,200
2	100% paid by landowners in affected suburb (per landowner per annum to 2070)	n/a	\$4,600	\$500
3	50% paid by landowners in the hazard area (per landowner per annum to 2070)	n/a	\$13,900	\$1,600
	50% paid by government (total to 2070)	n/a	\$17.5 mil	\$2mil
4	100% paid by government (total to 2070)	\$14 mil	\$35 mil	\$4 mil



# Defining the SAR Area

If development densities are high enough to make a SAR affordable, how do we define the area for applying the SAR?

LG's in WA are encouraged to use setback formulas that are designed for siting greenfield development to identify coastal hazard areas.  
Purposefully conservative.

Are these conservative formulas appropriate for reasonably identifying areas and landowners who are likely to benefit from protection works?



# Summary

Funding is a major constraint to uniform adaptation (through relocation or protection)

Many solutions proposed are likely to have a significant impact on the capacity of LG's to deliver other community services over the long term

If we move toward user pays, is it appropriate to use conservative formulas for applying specified area rates? If not, what formula should be used?



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# Thank you

CONCLUSIVE PROOF OF STABLE SEA LEVELS

STILL ONLY COMES  
HALF-WAY UP A DUCK



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